

IN THE CLAIMS

Claims 1,2,3 and 5 are shown as amended with claims 6 and 7 being newly added:

The following is a listing of the claims in the application.

Claim 1. (Currently Amended) A pollen sensor comprising:

an illumination portion for generating a light beam having an incident optical axis for illuminating particles floating in air in a detection zone of the pollen sensor, with the light beam polarized in a given direction perpendicular to the incident optical axis;

a first receiver aligned at a first angle with respect to said incident optical axis for selectively measuring the intensity (I_p) of light beams from the detection zone polarized parallel to the light beam polarized in said given direction from said illumination portion with the light beam selected from a group of light beams scattered by said floating particles;

a second receiver aligned at a second angle spaced radially apart from the alignment axis of said first receiver to form a complementary angle of substantially equal dimension with respect to said incident optical axis for measuring the intensity (I_s) of light beams from the detection zone polarized perpendicular to the light beam polarized in said given direction from the illumination portion with the light beam selected from the group of light beams scattered by the floating particles; and

means for discriminating pollen particles from other floating particles including means for computing the degree of polarization of such particles as an arithmetic value from the intensity (I_p) of the polarized light beam detected by the first receiver and the intensity (I_s) of the polarized light beam detected by the second receiver.

Claim 2. (Currently Amended) The pollen sensor as set forth in Claim 1, further comprising a first polarizing filter associated with said first receiver with said first polarizing filter having a polarizing axis set parallel to said incident optical axis, a second polarizing filter associated with said second receiver with said second polarizing filter having a polarizing axis set perpendicular to said incident optical axis and wherein said degree of polarization is computed in accordance with the following formula:

$$\text{degree of polarization} = (I_p - I_s) / (I_p + I_s)$$

wherein (I_p) is the intensity of the polarized light beam detected by the first receiver and (I_s) is the intensity of the polarized light beam detected by the second receiver.

Claim 3. (Currently Amended) A pollen sensor comprising:

an illumination portion for generating a light beam having an incident optical axis for illuminating particles floating in air in a detection zone of the pollen sensor with the light beam polarized in a given direction perpendicular to the incident optical axis;

a first receiver aligned at a first angle with respect to said incident optical axis for measuring the intensity (I) of a light beam scattered by said floating particles; and

a second receiver aligned at a second angle spaced radially apart from the alignment axis of said first receiver to form a complementary angle of substantially equal dimension with respect to said incident optical axis for selectively measuring the intensity (Is) of a light beam polarized in a direction perpendicular to light illuminated by the illumination portion with the light beam selected from a group of light beams scattered by the floating particles; and

means for discriminating pollen particles from other floating particles in accordance with the degree of polarization of such particles based upon the intensity (I) of the scattered light beam detected by the first receiver and the intensity (Is) of the polarized light beam detected by the second receiver.

Claim 4. (Original) The pollen sensor as set forth in Claim 3, wherein said degree of polarization is computed from the following formula:

$$\text{degree of polarization} = (I - I_s) / I$$

wherein (I) is the intensity of the scattered light beam detected by the first receiver and (Is) is the intensity of the polarized light beam detected by the second receiver.

Claim 5. (Currently Amended) A method for detecting the presence of pollen particles floating in air in a detection zone and for discriminating

between pollen particles and other particles on a real time basis comprising the steps of:

generating a light beam having an incident optical axis for illuminating particles floating in air in a detection zone with the light beam being polarized in a given direction perpendicular to the incident optical axis;

using a first receiver aligned at a first angle with respect to said incident optical axis for selectively measuring the intensity (I) or (Ip) of a light beam from the detection zone polarized parallel to the light beam polarized in said given direction from said illumination portion with the light beam selected from a group of light beams scattered by said floating particles in said detection zone;

using a second receiver aligned at a second angle spaced radially apart from the alignment axis of said first receiver to form a complementary angle of substantially equal dimension with respect to said incident optical axis for selectively measuring the intensity (Is) of a light beam from the detection zone polarized perpendicular to the light beam polarized in said given direction from said illumination portion with the light beam selected from the group of light beams scattered by the floating particles in said detection zone; and

measuring the degree of polarization of such particles as an arithmetic value from the intensity (Ip) of the polarized light beam detected by the first receiver and the intensity (Is) of the polarized light beam detected by the second receiver for distinguishing between pollen particles and other particles.

6. (New) The pollen sensor as set forth in Claim 1 wherein the first and second receivers are radially spaced 60° apart.

7. (New) The pollen sensor as set forth in Claim 3 wherein the first and second receivers are radially spaced 60° apart.